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EXAMINER	
SHOSHO, CALLIE E	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/807,025	REHMAN ET AL.	
	Examiner	Art Unit	
	Callie E. Shosho	1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 May 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8,9,11-19,21-26,28 and 29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8,9,11-19,21-26,28 and 29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/22/07 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 21-26 and 28-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang et al. (U.S. 2005/0027035) taken in view of the evidence given in Belmont et al. (U.S. 5,571,311)

Wang et al. disclose ink jet ink comprising water, 0.01-50% co-solvent, 0.1-10% styrene-maleic anhydride, 0.1-5% surfactant, and 0.1-10% self-dispersing pigment possessing particle size of 0.005-1 μm. It is noted that the styrene-maleic anhydride includes that known under the

tradename SMA-1000H that has weight average molecular weight of 5,500. For specific types of self-dispersing pigments, Wang et al. points to Belmont et al. that discloses (col.4, lines 7-16 and col.5, lines 4-21 and 31-33) acid-functionalized pigment, i.e. pigment having organic group attached thereto wherein the organic comprises alkyl group and at least one acid group (paragraphs 1, 13, 17, 19-21, 24, 27, 42, 44, and 46).

Attention is drawn to black ink #3 (paragraph 56) that comprises 0.5% ammonium benzoate, 0.35% TRIS buffer, 7.5% 1,5-pentanediol, 7.5% 2-methyl-1,3-propanediol, 4.5% 2-pyrrolidone, 0.15% surfactant, i.e. Surfynol, 3% self-dispersing pigment, and 0.8% styrene-maleic anhydride, i.e. SMA-1000H.

Given that Wang et al. disclose ink identical to that presently claimed, it is clear that the ink is inherently reliably jettable at all firing frequencies ranging from 3-25 kHz and inherently reliably jettable at drop volume from about 10 pL to 20 pL.

In light of the above, it is clear that Wang et al. anticipate the present claims.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-3, 6, 8, 11-13, and 16-18 rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al. (U.S. 6,214,100) in view of Zhu (U.S. 5,889,083) and Suzuki et al. (U.S. 6,874,881).

Parazak et al. disclose system for printing images onto substrate comprising ink jet ink and ink jet printer wherein the ink comprises water, 0.001-10% acid functionalized pigment having mean diameter of 0.005-10 μm, 0.01-50% co-solvent including 1,5-pentanediol, 2-pyrrolidone, and ethoxylated glycerol, 0.01-5% surfactant, and other acrylic or non-acrylic polymer to improve various properties of the ink. There is also disclosed a method of ink jetting

the ink onto the substrate (col.1, lines 13-20, col.2, lines 35-37, col.3, lines 19-30 and 56-61, col.4, line 15, col.4, lines 41-43 and 54-56, col.4, line 64-col.5, line 1, and col.5, lines 33-40).

Attention is drawn to col.5, lines 33-40 that disclose ink comprising 3% modified pigment, 5% ethoxylated glycerol, 9% 2-pyrrolidone, 2% 1,5-pentanediol, and water. It is disclosed that the modified pigment is acid functionalized wherein the acid precursor used to form the modified pigment is isophthalic acid.

The difference between Parazak et al. and the present claimed invention is the requirement in the claims of (a) styrene-maleic anhydride and (b) printhead configured for specific firing frequency and drop volume.

With respect to difference (a), Zhu, which is drawn to ink jet ink, disclose the use of styrene-maleic anhydride binder to fix colorant to substrate wherein the binder has weight average molecular weight of 1,500-50,00. Attention is called to col.5, lines 63-65 of Zhu that discloses styrene-maleic anhydride with weight average molecular weight of 5,600 (col.4, lines 47-51 and 62-67 and col.5, line 57-col.6, line 9).

Given that Parazak et al. in combination with Zhu disclose ink as presently claimed, it is clear that the ink intrinsically would be reliably jettable at firing frequencies ranging from 3 kHz to 25 kHz as presently claimed.

With respect to difference (b), Suzuki et al. disclose ink jet printer that ejects ink of 20 pL or less and that possesses firing frequency of 10 kHz or higher (col.10, lines 31-37) in order to produce high quality image printing at high speed (col.10, lines 31-37).

In light of the motivation for using styrene maleic anhydride disclosed by Zhu as described above and for using printer configured for specific firing frequency and drop volume

disclosed by Suzuki et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use styrene-maleic anhydride in the ink of Parazak et al. in order to produce ink with good colorant adhesion to substrate, i.e. produce ink with good smudge resistance, durability, etc., and to use such printer in the system of Parazak et al. in order to produce ink that produce high quality image printing at high speed, and thereby arrive at the claimed invention.

7. Claims 4-5 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al. in view of Zhu and Suzuki et al. as applied to claims 1-3, 6, 8, 11-13, and 16-18 above, and further in view of Osumi et al. (U.S. 6,280,513).

The difference between Parazak et al. in view of Zhu and Suzuki et al. and the present claimed invention is the requirement in the claims of ammonium benzoate.

Osumi et al., which is drawn to ink jet ink, disclose the use ammonium benzoate in order to produce waterfast image that possesses good re-ejection characteristics from the printer (col.9, lines 60-67).

In light of the motivation for using ammonium benzoate disclosed by Osumi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use ammonium benzoate in the ink of Parazak et al. in order to produce waterfast ink that possesses good re-ejection characteristics from the printer, and thereby arrive at the claimed invention.

8. Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al. in view of Zhu and Suzuki et al. as applied to claims 1-3, 6, 8, 11-13, and 16-18 above, and further in view of Ohta et al. (U.S. 2002/0198287).

The difference between Parazak et al. in view of Zhu and Suzuki et al. and the present claimed invention is the requirement in the claims of trishydroxymethylaminomethane.

Ohta et al., which is drawn to ink jet ink, disclose the use of trishydroxymethylaminomethane as pH buffer in order to control the pH of the ink and to produce durable, stable ink (paragraph 107).

In light of the motivation for using trishydroxymethylaminomethane disclosed by Ohta et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use trishydroxymethylaminomethane in the ink of Parazak et al. in order to produce durable, stable ink with desired pH, and thereby arrive at the claimed invention.

9. Claims 21-23, 26, and 28 rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al. (U.S. 6,214,100) in view of Zhu (U.S. 5,889,083).

Parazak et al. disclose system for printing images onto substrate comprising ink jet ink and ink jet printer wherein the ink comprises water, 0.001-10% acid functionalized pigment having mean diameter of 0.005-10 μm, 0.01-50% co-solvent including 1,5-pentanediol, 2-pyrrolidone, and ethoxylated glycerol, 0.01-5% surfactant, and other acrylic or non-acrylic polymer to improve various properties of the ink. There is also disclosed a method of ink jetting the ink onto the substrate (col.1, lines 13-20, col.2, lines 35-37, col.3, lines 19-30 and 56-61, col.4, line 15, col.4, lines 41-43 and 54-56, col.4, line 64-col.5, line 1, and col.5, lines 33-40).

Attention is drawn to col.5, lines 33-40 that disclose ink comprising 3% modified pigment, 5% ethoxylated glycerol, 9% 2-pyrrolidone, 2% 1,5-pentanediol, and water. It is disclosed that the modified pigment is acid functionalized wherein the acid precursor used to form the modified pigment is isophthalic acid.

The difference between Parazak et al. and the present claimed invention is the requirement in the claims of styrene-maleic anhydride.

Zhu, which is drawn to ink jet ink, disclose the use of styrene-maleic anhydride binder to fix colorant to substrate wherein the binder has weight average molecular weight of 1,500-50,00. Attention is called to col.5, lines 63-65 of Zhu that discloses styrene-maleic anhydride with weight average molecular weight of 5,600 (col.4, lines 47-51 and 62-67 and col.5, line 57-col.6, line 9).

Given that Parazak et al. in combination with Zhu disclose ink as presently claimed, it is clear that the ink intrinsically would be reliably jettable at all firing frequencies from 3 kHz to 25 KHz.

In light of the motivation for using styrene maleic anhydride disclosed by Zhu as described above, it therefore would have been obvious to one of ordinary skill in the art to use styrene-maleic anhydride in the ink of Parazak et al. in order to produce ink with good colorant adhesion to substrate, i.e. produce ink with good smudge resistance, durability, etc., and thereby arrive at the claimed invention.

10. Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al. in view of Zhu as applied to claims 21-23, 26, and 28 above, and further in view of Osumi et al. (U.S. 6,280,513).

The difference between Parazak et al. in view of Zhu and the present claimed invention is the requirement in the claims of ammonium benzoate.

Osumi et al., which is drawn to ink jet ink, disclose the use ammonium benzoate in order to produce waterfast image that possesses good re-ejection characteristics from the printer (col.9, lines 60-67).

In light of the motivation for using ammonium benzoate disclosed by Osumi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use ammonium benzoate in the ink of Parazak et al. in order to produce waterfast ink that possesses good re-ejection characteristics from the printer, and thereby arrive at the claimed invention.

11. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al. in view of Zhu as applied to claims 21-23, 26, and 28 above, and further in view of Ohta et al. (U.S. 2002/0198287).

The difference between Parazak et al. in view of Zhu and the present claimed invention is the requirement in the claims of trishydroxymethylaminomethane.

Ohta et al., which is drawn to ink jet ink, disclose the use of trishydroxymethylaminomethane as pH buffer in order to control the pH of the ink and to produce durable, stable ink (paragraph 107).

In light of the motivation for using trishydroxymethylaminomethane disclosed by Ohta et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use trishydroxymethylaminomethane in the ink of Parazak et al. in order to produce durable, stable ink with desired pH, and thereby arrive at the claimed invention.

12. Claims 1-3, 6, 8, 11-13, and 16-17 rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al. (U.S. 6,214,100) in view of Zhu (U.S. 5,889,083) and Oikawa et al. (U.S. 6,652,055).

Parazak et al. disclose system for printing images onto substrate comprising ink jet ink and ink jet printer wherein the ink comprises water, 0.001-10% acid functionalized pigment having mean diameter of 0.005-10 μm, 0.01-50% co-solvent including 1,5-pentanediol, 2-pyrrolidone, and ethoxylated glycerol, 0.01-5% surfactant, and other acrylic or non-acrylic polymer to improve various properties of the ink. There is also disclosed a method of ink jetting the ink onto the substrate (col.1, lines 13-20, col.2, lines 35-37, col.3, lines 19-30 and 56-61, col.4, line 15, col.4, lines 41-43 and 54-56, col.4, line 64-col.5, line 1, and col.5, lines 33-40).

Attention is drawn to col.5, lines 33-40 that disclose ink comprising 3% modified pigment, 5% ethoxylated glycerol, 9% 2-pyrrolidone, 2% 1,5-pentanediol, and water. It is disclosed that the modified pigment is acid functionalized wherein the acid precursor used to form the modified pigment is isophthalic acid.

The difference between Parazak et al. and the present claimed invention is the requirement in the claims of (a) styrene-maleic anhydride and (b) printhead configured for specific firing frequency.

With respect to difference (a), Zhu, which is drawn to ink jet ink, disclose the use of styrene-maleic anhydride binder to fix colorant to substrate wherein the binder has weight average molecular weight of 1,500-50,00. Attention is called to col.5, lines 63-65 of Zhu that discloses styrene-maleic anhydride with weight average molecular weight of 5,600 (col.4, lines 47-51 and 62-67 and col.5, line 57-col.6, line 9).

Given that Parazak et al. in combination with Zhu disclose ink as presently claimed, it is clear that the ink intrinsically would be reliably jettable at firing frequencies ranging from 3 kHz to 25 kHz as presently claimed.

With respect to difference (b), Oikawa et al., which is drawn to ink jet printer, disclose setting the firing frequency of the printer to several tens of kHz in order to meet demands for faster printing and higher resolution (col.2, lines 19-23).

In light of the motivation for using styrene maleic anhydride disclosed by Zhu as described above and for using printer configured for specific firing frequency disclosed by Oikawa et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use styrene-maleic anhydride in the ink of Parazak et al. in order to produce ink with good colorant adhesion to substrate, i.e. produce ink with good smudge resistance, durability, etc., and to use such printer in the system of Parazak et al. in order to produce ink that produce high resolution image when printing at high speed, and thereby arrive at the claimed invention.

13. Claims 4-5 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al. in view of Zhu and Oikawa et al. as applied to claims 1-3, 6, 8, 11-13, and 16-17 above, and further in view of Osumi et al. (U.S. 6,280,513).

The difference between Parazak et al. in view of Zhu and Oikawa et al. and the present claimed invention is the requirement in the claims of ammonium benzoate.

Osumi et al., which is drawn to ink jet ink, disclose the use ammonium benzoate in order to produce waterfast image that possesses good re-ejection characteristics from the printer (col.9, lines 60-67).

In light of the motivation for using ammonium benzoate disclosed by Osumi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use ammonium benzoate in the ink of Parazak et al. in order to produce waterfast ink that possesses good re-ejection characteristics from the printer, and thereby arrive at the claimed invention.

14. Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al. in view of Zhu and Oikawa et al. as applied to claims 1-3, 6, 8, 11-13, and 16-17 above, and further in view of Ohta et al. (U.S. 2002/0198287).

The difference between Parazak et al. in view of Zhu and Oikawa et al. and the present claimed invention is the requirement in the claims of trishydroxymethylaminomethane.

Ohta et al., which is drawn to ink jet ink, disclose the use of trishydroxymethylaminomethane as pH buffer in order to control the pH of the ink and to produce durable, stable ink (paragraph 107).

In light of the motivation for using trishydroxymethylaminomethane disclosed by Ohta et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use trishydroxymethylaminomethane in the ink of Parazak et al. in order to produce durable, stable ink with desired pH, and thereby arrive at the claimed invention.

Response to Arguments

15. Applicants' arguments filed 5/22/07 have been fully considered but they are not persuasive.

Specifically, applicants argue that Suzuki et al. teach that the high speed printing frequency has upper limit of 15 kHz and thus, combination of Parazak et al. with Zhu and Suzuki et al. would have no likelihood of success in providing system, method, or ink of present invention. Applicants argue that the present invention requires ink having capability of being printed over a broad range of frequency which is not taught by the combination of Parazak et al. with Zhu and Suzuki et al.

However, it is noted that while Suzuki et al. do disclose that "in practice" the upper limit of the drive frequency of a thermal ink jet printer is "about 15 kHz", it is significant to note that Suzuki et al. also disclose that the drive frequency is "not limited" and that given the demand for high quality image printing at a high speed, the drive frequency of ink jet recording head has been increased to "even 10 kHz or higher" which would encompass the presently claimed firing frequency of 12 kHz to 25 kHz.

Applicants argue that when Suzuki et al. is viewed as a whole, Suzuki et al. effectively limits the frequency to 15 kHz.

However, while it is agreed that Suzuki et al. disclose using firing frequency of 15 kHz given that 15 kHz is the upper limit of the drive frequency of the thermal ink jet printer utilized in Suzuki et al. (col.10, lines 41-44), Suzuki et al. also teach that firing frequency can be increased to 10 kHz or higher given the demand for high quality printing at higher speed (col.10, lines 31-35). Thus, it therefore would have been obvious to one of ordinary skill in the art to

utilize printer with firing frequency including 12-25 kHz as presently claimed in order to produce high quality image printing at high speed, and thereby arrive at the claimed invention.

Applicants also argue that the cited prior art does not teach the ability of the ink of being printed over a broad range of frequencies.

However, while it is agreed that there is no disclosure on Parazak et al., Zhu, or Suzuki et al. that the ink has the capability of being printed over a broad range of frequencies, i.e. 3 kHz to 25 kHz, given that Parazak et al. in combination with Zhu disclose ink as presently claimed, it is clear that the ink intrinsically would be reliably jettable at firing frequencies ranging from 3 kHz to 25 kHz as presently claimed.

Applicants argue that the combination of Parazak et al. with Zhu is improper given that Zhu discloses limiting the amount to solvent to 20% and thus, the combination of Parazak et al. with Zhu would destroy the purpose of Zhu by using solvent combination in excess of the requirement or desired amount taught by Zhu. Applicants also argue that the ink of Suzuki et al. require the use of glycerin and ethylene urea for high-speed printing which would have to be used in addition to the co-solvent combination disclosed by Parazak et al. and as such the combination of Parazak et al. with Zhu and Suzuki et al. would contain a minimum of five solvents. Given the amounts of solvent disclosed by Parazak et al. and Zhu in the examples of each reference, applicants argue that the combination of Parazak et al. with Zhu would require 26-43% solvent which would clearly fall outside the teachings of Zhu that only utilizes "small amounts of solvent".

However, on the one hand, it is noted that neither Zhu nor Suzuki et al. are used for their teaching of solvent or the amount of solvent utilized. Parazak et al already teach the presently claimed solvents. Zhu and Suzuki et al. are each used as a teaching reference, and therefore, it is not necessary for these secondary references to contain all the features of the presently claimed invention, *In re Nievelt*, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973), *In re Keller* 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). It is noted that the "test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference...Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art", *In re Keller*, and that "combining the teachings of references does not involve an ability to combine their specific structures", *In re Nievelt*. Rather these references teach a certain concept, namely, the use of styrene-maleic anhydride binder in ink jet inks (Zhu) and that it is known to use ink jet printer that ejects ink of 20 pL or less and that possesses firing frequency of 10 kHz or higher in order to produce high quality image printing at high speed (Suzuki et al.) and in combination with the primary reference, discloses the presently claimed invention.

Applicants argue that each reference must be considered as a whole and that Zhu teaches away from Parazak et al. and Suzuki et al. combination given that Zhu teaches away from using organic solvent by limiting the solvent to "small amounts". However, attention is drawn to MPEP 2145 III which discloses that the claimed combination cannot change the operation of the primary reference or render the reference inoperable for its intended purpose. Thus, while it is agreed that Zhu limits the use of solvent to 20%, Zhu is not the primary reference utilized by the examiner, Parazak et al. is. The disclosure in Zhu to use such amount of solvent does not render

Parazak et al. inoperable for its intended purpose. Given that Zhu teaches amount of solvent below 20% which overlaps the amount presently claimed as well as that disclosed by Parazak et al., it is the examiner's position that Zhu does not teach away from the present invention.

On the other hand, even if the amount of combined solvent were calculated from Parazak et al. and Zhu, a fair reading of Parazak et al. as a whole discloses the use of 0.01-50% solvent (col.4, lines 18-19) while Zhu discloses amount of solvent that is below about 20%. Thus, the amount of solvent disclosed by Parazak et al. and Zhu combined would broadly range from 0.01-70% which would overlap the amount of solvent presently claimed as well as that disclosed by Zhu. Thus, given that the combination of Parazak et al. with Zhu does not require amount of solvent in excess of the amount taught by Zhu, it is the examiner's position that Zhu does not teach away from concentration of solvents that are required under the present combination of references.

Further, even if one were to include the glycerin and ethylene urea of Suzuki et al. in the ink of the combination of Parazak et al., Zhu, and Suzuki et al., given the open language of the present claims with respect to solvent, i.e. "organic solvent content includes", it is clear that the use of additional solvents is not excluded from the scope of the present claims.

Applicants argue that there is no disclosure in the cited prior art that the ink is jettable at all firing frequencies ranging from 3 kHz to 25 kHz.

However, although there is no explicit disclosure in Parazak et al., Zhu, or Suzuki et al. that the ink is jettable at all firing frequencies ranging from 3 kHz to 25 kHz, it is the examiner's position that given that Parazak et al. in combination with Zhu disclose ink as presently claimed,

i.e. comprising liquid vehicle, acid-functionalized pigment, and styrene-maleic anhydride as presently claimed, the ink would intrinsically be jettable at firing frequencies ranging from 3 kHz to 25 kHz.

Applicants argue that while it is known that the compositional components of the present ink have been used prior to the present invention, the inquiry for patentability is not the known use of individual elements but whether the present combination of elements was obvious at the time of invention. Specifically, applicants argue that there is no motivation to combine Parazak et al. with Zhu given that nothing in Parazak et al. suggests that a styrene-maleic anhydride copolymer would be useful for high speed printing or for ink compositions in general.

While there is no disclosure in Parazak et al. of styrene-maleic anhydride, it is noted that Parazak et al. discloses including "other acrylic or non-acrylic polymer" to improve various properties on the ink (col.4, lines 54-56). Zhu, which is drawn to ink jet ink, disclose the use of styrene-maleic anhydride binder to fix colorant to substrate.

Thus, it would have been obvious to one of ordinary skill in the art, absent evidence to the contrary, to use styrene-maleic anhydride as a "other acrylic or non-acrylic polymer" in Parazak et al. in order to improve a property of the ink, i.e. to improve the adhesion of the ink to substrate, and thereby arrive at the claimed invention.

Similarly, applicants also argue that there is nothing in Parazak et al. that suggests the use of ammonium benzoate or trishydroxymethylaminoethane as required in present claims 25 and 29, respectively.

It is agreed that there is no disclosure in Parazak et al. of ammonium benzoate or trishydroxymethylaminoethane, however, it is significant to note that Parazak et al. do disclose that various types of additives may be added to the ink in order to optimize properties of the ink (col.4, lines 44-47), which is why Parazak et al. is used in combination with Osumi et al., that disclose the use of ammonium benzoate in order to produce image that produces good re-ejection characteristics from the printer, and Ohta et al., that disclose the use of trishydroxymethylaminoethane as a pH buffer to control the pH of the ink and produce durable, stable ink.

Thus, given that there is proper motivation to combine Parazak et al. with Zhu, Ohta et al., and Osumi et al., it is the examiner's position that each of the cited combination of references is proper.

Applicants argue that the present invention has listed the printing frequencies as required elements of the composition claims, i.e. to further limit the scope of the claims.

However, it is the examiner's position, absent evidence to the contrary, that the ink of Parazak et al., Zhu, and Suzuki et al. not only meets the compositional requirements of the present claims but given that it meets these compositional requirements, the ink also intrinsically meets the requirements of the claims with respect to the jettable of the ink at 3 kHz to 25 kHz. Given that the combination of references disclosed ink as presently claimed, it is not clear how the ink would not meet the requirements of the present claims with respect to the printing frequency. While applicants concede that not all inks within the compositional ranges are printable over the claimed firing frequency, applicants have provided no evidence that the ink of

the cited prior art is not printable over the claimed range of firing frequency. Given that Parazak et al. in combination with Zhu meet claimed type and amounts of ingredients as presently claimed, it is not clear when such ink would not be printable over presently claimed range of firing frequency.

Applicants argue that the combination of references utilized to meet the requirements of the present claims is based on impermissible hindsight.

However, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). Further, as described above, given that there is motivation to combine Parazak et al. with Osumi et al. or Ohta et al., it is the examiner's position that the combination of references is not based on impermissible hindsight, but rather is based on motivation to combine found in the references themselves.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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